MULTIPLE BENEFITS CONSERVATION PLAN

Prepared for

The Hampton Roads Planning District Commission

Prepared by

LandMark Design Group, Inc.
Engineers-Planners-Environmental Consultants
5544 Greenwich Road
Virginia Beach, Virginia 23462

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1.0 EXECUTIVE SUMMARY

This report summarizes the development of the Southern Watershed Area Multiple Benefits Conservation Plan (MBCP). The MBCP is designed to develop a strategy for increasing the effectiveness of wetlands compensation and other types of conservation measures in the Southern Watershed Area (SWA). Specifically, the MBCP addresses measures to achieve multiple benefits from wetlands compensation decisions by identifying "focus" areas with regionally important habitat, water quality, flood and erosion control and recreational benefits and establishing an improved process of coordination between local, state and federal agencies involved in wetland compensation and conservation decisions. The MBCP is designed to address the concerns of the cities of Chesapeake and Virginia Beach regarding the need for more effective wetland compensation decisions made by others as well as the need for guidance concerning compensation for their own projects.

Since federal and state wetlands programs provide one of the most significant vehicles for restoring and preserving wetlands resources, the principal focus of this report is on the administration of the state and federal wetland regulatory programs as they relate to the potential for achieving multiple benefits. However, the report also outlines other regulatory, land acquisition, and voluntary land management programs which can assist in the goals of the MBCP.

This report, and the work of the Technical Advisory Committee (TAC) which assisted the Hampton Roads Planning District Commission (HRPDC) in preparing it, stems from the following findings of the MBCP work group:

1. There is a need for greater effectiveness and efficiency in wetland compensation location decisions;

2. Potential wetland compensation sites exist that can provide multiple benefits to the community;

3. These areas consist primarily of riparian corridors along the three main water bodies of the region. However, there are opportunities to acquire properties, which support the “greenways” concept contained in the Virginia Department of Conservation and Recreation’s latest natural areas conservation plan for the Southern Watershed.

4. Regulatory and non-regulatory options exist for implementation and can be combined to ensure the success of the plan;

5. Support exists for mutual cooperation between SWAMP stakeholders (i.e. local and regional governments, state and federal agencies and private parties); and

6. The goals of the MBCP can be largely accomplished without conflicting with other SWAMP elements or economic development.

The following elements constitute the strategy for achieving a multiple benefits conservation plan:

1. Develop a process for information exchange through data and information sharing and the establishment of a forum for continued cooperation and support between municipal, regional, regulatory and resource agencies as well as private conservation organizations;

2. Identify focus areas for restoration, enhancement and preservation through land acquisition and other conservation measures which achieve multiple benefits;

3. Outline a site identification process that allows for the identification of specific lands whose conservation or restoration achieves multiple benefits.

4. Identify wetland regulatory policies and measures which can assist in achieving multiple benefits;

5. Identify other non-regulatory measures capable of promoting the goals of the MBCP; and

6. Modify local land use controls and comprehensive plans to reflect MBCP goals and objectives.

Element Two is the centerpiece of the strategy. The identified "focus areas" serve as priority areas where the restoration and/or conservation of resources should be encouraged. In order to maximize benefits from these focus areas, a site selection process is outlined to further refine their uses. The site selection process is designed to guide decision makers to specific sections of a focus area based on the watershed (or sub-watershed) of the impact being compensated for, the functions of the wetlands being lost, and community type of wetlands affected. The procedure is a multi-step process that combines the efforts of the Virginia Department of Conservation and Recreation and the MBCP Technical Advisory Committee (TAC). This procedure generally follows the process generally endorsed by the State and federal agencies issuing wetlands permits in identifying sites for wetland compensation.

The MBCP is also designed to provide general guidance to the cities of Chesapeake and Virginia Beach on the potential location of wetland compensation banks or consolidated sites.

One of the principal objectives of the report is to provide reference material for wetland program administrators and local officials. Accordingly, the report contains mapping and data resources designed to assist in identifying lands with multiple environmental benefits, which are suitable for restoration and/or conservation. It is anticipated that the information and procedures contained in the report will assist in streamlining the process of securing wetlands permits by providing guidance and data on the location of multiple benefit compensation sites of interest to regulatory agencies.

2.0 INTRODUCTION AND BACKGROUND

> "The watersheds of the North Landing River, the Northwest River and Back Bay, collectively referred to…as the Southern Watersheds…constitute a unique and sensitive environment, inclusive of coastal primary sand dunes, tidal wetlands, non-tidal wetlands, and sensitive soils. Extensive floodplains and marsh fringes bordering the waterways within the Southern Watersheds provide a unique and valuable habitat…[and] has an intrinsic water quality value due to the ecological and biological processes they perform or which occur within them. Much of the land area comprising the Southern Watersheds currently supports forestal, agricultural, recreational, and conservation activities. Any

future development must be undertaken in a manner which encourages harmony among development, agriculture, recreation, and conservation." (City of Virginia Beach Southern Watersheds Management Ordinance §2(a), (b) and (c))

2.1 The Southern Watershed Area Management Program

To protect natural resources, sensitive lands, and water supplies, the cities of Chesapeake and Virginia Beach, in partnership with the Hampton Roads Planning District Commission and the Virginia Coastal Program, initiated the Southern Watershed Area Management Program (SWAMP) in 1994. SWAMP's purpose is the development of a collaborative management effort for the Southern Watershed Area, comprised of the Back Bay, North Landing River, and Northwest River watersheds. The intent is to balance protection of the Southern Watershed's critical environmental resources with economic development opportunities.

The effort is funded by the above listed partners with grant assistance under Section 309 of the Coastal Zone Protection Act of 1996. This funding is available from the National Oceanic and Atmospheric Administration (NOAA) to coastal states with federally approved coastal zone management programs. Plan funds were provided by the Virginia Department of Environmental Quality's (VDEQ) Coastal Resources Management Program, pursuant to NOAA Award Numbers NA87OZ0253-01 and VA97020181-01.

The SWAMP has the following goals:

- Protect and enhance water quality for water supplies and natural resources conservation;
- Preserve open lands to help protect and enhance water quality;
- Ensure compatibility of recreational activities and commerce with natural resource protection;
- Retain the rural character of the Southern Watershed while providing for rural residential development; and
- Sustain and encourage agriculture and silviculture activities in the Southern Watershed Area.

The SWAMP is divided into several program and grant phases, each designed to build on the achievements of the previous Phase. Phases I and II were primarily organizational and data collection phases. Phase III of the SWAMP established five Program Enhancements necessary to accomplish the goals of the SWAMP:

1. Refine development controls to protect water quality and preserve critical habitat by
   - Establishing a Rural Area Preservation Program in the City of Chesapeake and
   - Establishing a Mitigation Strategy;
2. Improve the effectiveness of Preservation Districts by
   - Modifying the definition and delineation of the P-1 Preservation District in the Virginia Beach Zoning Ordinance and
   - Modifying the definition and delineation of the C-1 Conservation District in the Chesapeake Zoning Ordinance;
3. Protect habitats by
   - Developing a Conservation Easement Memorandum of Agreement and
   - Developing an Information Exchange Memorandum of Agreement;

4. Improve urban and agricultural Best Management Practices (BMPs) by developing a Memorandum of Agreement on urban and agricultural stormwater BMPs; and
5. Manage competing waterway uses by developing a Waterway Use Conflict Management Memorandum of Agreement.

Phases IV, V, and VI of the SWAMP began the process of developing and refining these Program Enhancements. During Phase V, a portion of Program Enhancement 1, the establishment of a "mitigation strategy" for the Cities of Chesapeake and Virginia Beach, emerged as an important step to implement the program's policy to refine development controls to protect water quality and preserve critical habitat. It was determined that the mitigation strategy sought by both municipalities should preserve as well as protect the cities' extensive wetland and natural areas by providing tangible economic, conservation, and recreation benefits. The strategy should provide "mitigation" opportunities for future capital projects as well as conserve large areas of habitat, provide passive recreational opportunities, allow for regional stormwater management, and maintain and improve local water quality.

2.2 Resources of the Southern Watershed

The Southern Watershed Area (SWA) is a 325-square mile area of southeastern Virginia consisting of those portions of the Cities of Chesapeake and Virginia Beach, Virginia that drain into the coastal waters of North Carolina through Back Bay, North Landing River, and Northwest River (Figure 1). It is part of the metropolitan area known as Hampton Roads, a group of 16 cities and counties with a combined population of approximately 1.5 million people. Approximately 50,000 of these persons reside in the SWA (1990 Census data). Additionally, an estimated 7,000 to 13,000 people per day (depending on season and day of the week) travel through the SWA to and from North Carolina (HRPDC personal communication, January 2001).

Although predominantly rural, some intensive land uses within the SWA include residential, commercial and industrial development and military installations. The SWA supports a plethora of natural resources, including wetlands, productive forests and agricultural lands, mineral resources, extensive waterways for boating and fishing, a variety of game species, and recreational beaches. Along with its well-known tourist beaches, the SWA contains a coastal state park, two national wildlife refuges, a waterfowl management area, and numerous municipal parks.

Ecologically, Virginia is in a unique position. It is the northern range limit for many southern species and the southern range limit for many northern species, creating an area with remarkable biodiversity. In addition to the hundreds of common plant and animal species occurring in the region, the SWA supports 19 rare communities, 67 rare plant species, and 22 rare animal species. Continued persistence in Virginia is key to the survival of many of these species and communities (*Conservation Plan for the Southern Watershed Area*, Virginia Department of Conservation and Recreation, 2000).

The soils and hydrology of the SWA are uniquely adapted to the development of wetland systems. Located within the broad floodplains of the Northwest River, North Landing River, and Back Bay on Pleistocene sands, silts, and clays, the SWA contains several soils series with a seasonally shallow (near surface) water tables. These wetland systems range from palustrine forests to herbaceous marshes and shallow-water submerged aquatic vegetation beds. Consequently, significant portions of

both the Cities of Chesapeake and Virginia Beach satisfy the soils, vegetation and hydrology criteria set forth in the 1987 Corps of Engineers *Wetland Delineation Manual* for jurisdictional wetlands protected by Sections 404 and 401 of the Clean Water Act and the State Water Control Law.

The unique terrestrial and aquatic resources of the SWA have undergone significant historical changes, first from agriculture and silviculture and their associated drainage modifications and then to more intensive land uses. In the last fifty years, and especially during the 1990s, the area has grown significantly in population. From 1990 to 1997, the populations of the Cities of Chesapeake and Virginia Beach increased by 25.9 percent and 6.9 percent, respectively (HRPDC, personal communication).

The continuing demands for more roads, schools, infrastructure, and commercial development to support an expanding economy has placed increasing pressure on a dwindling supply of suitable land for such projects. Increasingly, public and private development projects encroach on environmentally sensitive lands and create fragmentation of forest and other resources. This pressure has fostered concern on the part of localities for measures to protect the remaining resources while accommodating the need for continued growth in the cities. One method has been to identify, in advance, those areas important to the environment of the SWA, especially to the preservation of water quality and critical habitats. Another has been to secure the most benefits practicable from regulatory and non-regulatory actions involving the preservation of land or modification to land uses.

2.3 Need for a Mitigation Strategy

The "Agenda for Future Action" in the City of Virginia Beach's *1997 Comprehensive Plan* calls for the City to "develop a mitigation strategy for addressing impacts associated with the City's transportation and construction projects". The Comprehensive Plan dictates that this strategy will be designed "with emphasis on protecting ecosystems of the highest value, providing multiple benefits to the community, affording optimum water quality improvement, wildlife habitat enhancement, passive recreation, nature based tourism, and environmental education to best leverage limited public dollars." While not stated as formal policy, the City of Chesapeake has similar goals. The Multiple Benefits Conservation Plan (MBCP) is intended to be a guidance document that will assist City officials and officials of wetland regulatory and resource agencies in meeting this "agenda".

The MBCP is also designed to address certain deficiencies within the existing wetlands compensation program. Among these are:

1. Limited contact between state and federal wetland regulatory agencies and the cities of the SWAMP regarding local priorities for restoration and preservation of wetlands through the compensation process;

2. Lack of a comprehensive statement of local priorities to guide compensation decision makers;

3. Lack of adequate data resources and data management systems to rapidly identify potential wetland compensation sites;

4. Lack of a comprehensive framework for improving the effectiveness of compensation decisions with regard to local natural resource and recreation priorities; and

5. Limitations on the type of compensation which can be provided for wetlands impacts.

Accordingly, the MBCP is designed to begin the process of addressing these deficiencies.

2.4 The Concept of "Mitigation"

The term “mitigation”, while having a broad general understanding, has specific meaning within the framework of federal regulations designed to control the loss of wetlands. Section 404(b)(1) of the Clean Water Act (40 CFR Part 230) together with the *Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines* (February 6, 1990) requires sequential actions that collectively constitute the "mitigation" process. This sequencing begins with avoidance of wetlands, followed by minimization of wetland impacts, and finally compensation for unavoidable wetland impacts. While other elements of the SWAMP, such as the *Conservation Plan for the Southern Watershed* developed by the Virginia Department of Conservation and Recreation, provide the basis for avoidance and minimization of wetlands containing regionally significant natural heritage resources, the MBCP focuses primarily on the process by which compensation decisions are made.

2.5 Compensation and Conservation

As discussed in Section 4.2 below, a Technical Advisory Committee (TAC) was formed to provide advice and data to the consultant team and HRPDC in developing the “mitigation strategy.” Through discussions with the TAC, HRPDC concluded that, while the original goal of the mitigation strategy was primarily a *compensation*-based program, this orientation perhaps limited the mitigation strategy unnecessarily. The compensation objective focuses only on the replacement of impacted wetlands; however, wetland compensation sites provide other benefits as well, including recreation, education, wildlife habitat, possibly protected species habitat, and critical element buffers.

Combining the *compensation* objective with the *conservation* objective of the *Conservation Plan for the Southern Watershed* (Virginia Department of Conservation and Recreation 2000), allowed the effort to serve as an implementation method to meet the conservation objectives of SWAMP as well. Consequently, in order to more fully acknowledge the multiple benefits that wetland compensation sites can provide, the mitigation strategy has been renamed the “Multiple Benefits Conservation Plan” (MBCP).

2.6 Elements of the MBCP Strategy

The following elements constitute the strategy for achieving a multiple benefits conservation plan:

1. Develop a process for information exchange through data and information sharing and the establishment of a forum for continued cooperation and support between municipal, regional, regulatory and resource agencies as well as private conservation organizations;

2. Identify focus areas for restoration, enhancement and preservation through land acquisition and other conservation measures which achieve multiple benefits;

3. Outline a site identification process which allows for the identification of specific lands whose conservation or restoration achieves multiple benefits.

4. Identify potential wetland regulatory policies and measures which can assist in achieving multiple benefits;

5. Identify other non-regulatory measures capable of promoting the goals of the MBCP; and

6. Modify local land use controls and comprehensive plans to reflect MBCP goals and objectives.

Because the federal and state wetlands programs provide one of the principal vehicles for restoring and preserving wetlands resources, the principal focus of this report is the regulatory procedures for achieving multiple benefits. However, the report also outlines other regulatory (local land use programs), land acquisition, and voluntary land management programs which can assist in the goals of the MBCP.

The MBCP is intended as a guidance document and a resource tool. It is intended to work within the requirements of state and federal resource protection goals and regulations. Discussions with representatives from the U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USF&WS) and the Virginia Department of Environmental Quality (VDEQ) as well as with entities engaged in formulating compensation offers for wetlands impacts (such as the Virginia Department of Transportation) have emphasized the need to observe regulatory goals and program requirements while maintaining flexibility in formulating and accepting compensation offers. Consequently, it is not the intent of the MBCP to dictate where or how regulated wetland impacts must be compensated. Instead, as stated in the Executive Summary, it is the goal of the MBCP is to assist the regulatory, resource and development communities in streamlining the process of compensation by reducing the effort and improving the effectiveness of wetland compensation decisions. Accordingly, the MBCP is not intended as a static document, but rather a starting point for an evolving process to improve coordination among local, state and federal agencies in the administration of the wetland compensation process with the objective of maximizing benefits to the Southern Watershed.

3.0 EXISTING FRAMEWORK

As noted above, the MBCP must work within the existing regulatory and non-regulatory frameworks to be effective. While improvements to these frameworks may be warranted as the program develops, overall consistency with their goals and objectives is essential for implementation of a successful strategy.

Within the Commonwealth of Virginia, there are currently two primary regulatory frameworks for wetland and water quality protection: the federal program (authorized under the Clean Water Act and administered by the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers) and the state program (authorized under the (1) State Water Control Law and administered by the Virginia Department of Environmental Quality and (2) the State Wetlands Act and State Subaqueous

Law, both administered or supervised by the Virginia Marine Resources Commission). These State tidal wetlands program is also administered through local ordinances. Appendix A provides a list of federal and state policies that affect wetlands and water quality permitting and compensation decisions.

Equally applicable to the MBCP are the non-regulatory planning and land acquisition programs of various government, quasi-government, and conservation entities. The MBCP seeks to offer creative solutions to compensation requirements by tying the goals of both the regulatory and non-regulatory frameworks together in a manner consistent with existing policy.

3.1 Federal Regulatory Authorities

A number of federal laws and programs affect resource conservation and activity in wetlands. However, the Clean Water Act established the principal regulatory mechanism by which jurisdictional wetlands, especially non-tidal wetlands, are protected by the federal government. In addition to the Clean Water Act, the U.S. Army Corps of Engineers administers the Rivers and Harbors Act, which controls activities in navigable waters. The latter is administered under the same general permitting criteria as that for the Clean Water Act, but focuses on activities in navigable waters and, as such, creates compensation demands that are primarily focused on tidal wetlands and waters. As non-tidal wetlands comprise a significantly larger portion of the SWA's wetlands than do tidal wetlands, the Clean Water Act and its associated regulations produce the largest component of the SWA's compensation requirements.

Any action that proposes to place dredge or fill material into surface waters or wetlands falls under the jurisdiction of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. The Virginia Department of Environmental Quality (DEQ) administers the program for certification that federal decisions pursuant to Section 404 meet the water quality goals of the Commonwealth as required by Section 401 of the Clean Water Act (33 USC 1344). Both programs typically require compensation for wetlands impacts.

Surface waters and wetlands fall under the broad category of "waters of the United States" as defined in 22 CFR Part 328.3. Surface waters include all standing or flowing waters that have commercial or recreational value to the public. Wetlands are defined by Federal regulation at 33 CFR Part 328.2(b) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include: swamps, marshes, bogs, and similar areas". Wetlands are identified based on the presence of hydric soils, hydrophytic vegetation, and saturated or flooded conditions during all or part of the growing season.

The USACE's mitigation policy is largely contained in the "Section 404(b)1 Guidelines" published by the Environmental Protection Agency to administer the wetlands program. These guidelines establish a sequential process designed to reduce wetlands impacts consisting of avoidance and minimization of impacts and, finally, compensation. All federal permitting decisions for other than "deminimus discharges" must follow these guidelines in an effort to reduce and compensate for wetlands impacts. Avoidance and minimization, through such measures as siting criteria, project layout, construction practices and Best Management Practices, are emphasized. Unavoidable impacts require compensation according to specific guidelines in most cases.

The principal wetland regulatory policies affecting the MBCP are those governing the acceptability of compensation offers. These policies control the forms of and ratios for compensation. Federal agreements provide guidance on the types of compensation preferred (*Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404 (b)(1) Guidelines*, issued February 6, 1990).

Compensation can be "on-site" or "off-site". On-site is preferred, but is not always practicable. Off-site compensation may include purchase of credits in a commercial mitigation bank or payment of an *in-lieu* fee to the Virginia Wetland Restoration Trust Fund, administered by The Nature Conservancy. Payment of an *in-lieu* fee to the Trust Fund is allowed only when other measures are not available or appropriate. Fees paid into the Trust Fund are used to purchase and build compensation sites. The USACE has the final approval for all Trust Fund expenditures.

The USACE develops the cost of payments into the Trust Fund based on a number of factors including the cost of purchasing land for restoration, cost of wetlands replacement and the current cost of credits from commercial wetland compensation banks serving the project area. Additionally, the Norfolk District, U.S. Army Corps of Engineers has a policy that that *in lieu* fees (on a "per credit" basis) will not undercut the current market price of entrepreneurial mitigation banks credits available in the project area.

Restoration of wetlands, particularly restoration of Prior-Converted Croplands or wetlands in moist soil regimes, is the Norfolk District USACE's preference in many cases. Most projects employ a blend of wetland restoration and preservation, particularly if credits are purchased in a commercial mitigation bank. Current Norfolk District guidelines for wetland compensation ratios are as follows:

Forested restoration	2 credits of compensation: 1 acre of impact
Scrub/shrub restoration	1.5:1
Herbaceous/emergent restoration	1:1 to 1.5:1
Preservation	10:1 or greater

Although not formalized in Statute or regulation, the USACE follows the Federal goal of "no net loss" of wetlands. Accordingly, all wetlands compensation decisions are examined from the perspective of whether they attain at least 1:1 replacement of key functions of the impacted wetland. The difference between the 1:1 replacement requirement and the compensation goals discussed above may represent an opportunity to enhance multiple benefits by introducing non-wetland acreage into the compensation offer. New USACE regulations governing the administration of the Nationwide permit program allow the use of upland buffers as an acceptable form of compensation for certain wetland and stream impacts, thus providing additional flexibility in the formulation of wetland compensation offers.

There are also instances when preservation of wetlands may be the preferred form of compensation. This is especially true when the preservation is of high value wetlands that harbor rare species or unique habitats. However, the preservation area must be under demonstrable threat, such as timber harvesting or development.

3.2 State Regulatory Authority

The Commonwealth of Virginia administers the Clean Water Act, Section 401 Water Quality Certificate program on behalf of the Environmental Protection Agency. Additionally, Virginia has adopted a State Water Control Law establishing authority independent of the Clean Water Act. Both programs are administered through the Virginia Water Protection Permit Program. The Virginia Marine Resources Commission (VMRC) administers the State Subaqueous Law governing the use of State-owned subaqueous lands and also retains limited administrative and oversight responsibilities for the State Wetlands Law (Code of Virginia §28.2-1203). As such, VMRC is involved in permitting impacts to tidal wetlands and has developed guidelines for tidal wetlands compensation for use by its staff and local Wetlands Boards (*Wetland Mitigation and Compensation Policy*, 4VAC 20-390-10 *et seq.*)

In general, the Virginia Department of Environmental Quality (DEQ) implements permitting and compensation policies in conformance with Section 401 of the Clean Water Act. Regulations issued pursuant to the Virginia Water Protection Permit Program generally follow the policies contained in federal regulations with regard to acceptable forms of compensation (9 VAC 25-210 *et seq.*). For example, on-site mitigation is preferable to off-site mitigation. These regulations are currently being revised to accommodate new state wetlands control authorities granted to VDEQ.

The Commonwealth of Virginia, however, has implemented compensation statutes that, while generally followed by federal agencies, are not contained in the federal regulations. For example, State statutes establish rules for the location of certain forms of wetland compensation, e.g. wetlands "banks" (Code of Virginia §62.1-44.15:5). The goal of the VDEQ's policy is to maintain water quality protection within each watershed. As such, current state statutes require that, with some exceptions, compensation must be within the same watershed as the impact and must be in the same or an adjacent USGS hydrologic unit code (HUC). Under certain circumstances, compensation may be provided in adjacent watersheds.

This statute can create challenges where the boundaries with adjoining watersheds are unclear, such as that between the Southern Watershed and the Chesapeake Bay Watershed. A study by the U.S. Geological Survey and the Virginia Department of Environmental Quality is currently underway to determine the location of the boundary. This study may result in a change in the limits of the northern boundary of the southern watershed in the cities of Chesapeake and Virginia Beach.

Virginia law also codifies the types of compensation acceptable to the VDEQ. These are creation, restoration, purchase of credits in a commercial mitigation bank, contribution to the Virginia Wetlands Restoration Trust Fund (only in cases of small impact when credits in a commercial mitigation bank in that watershed are not available), and preservation of wetlands or upland buffers with a significant water quality benefit or critical habitat. Compensation ratios for projects which have significant individual or cumulative impacts must ensure "no net loss" and, as such, restoration or creation at 1:1 must be provided before preservation can be considered. In the case that no acceptable compensation is available within the impacted watershed and compensation is provided in another watershed, compensation ratios may increase.

The Virginia Marine Resources Commission (VMRC) requires compensation for unavoidable losses of tidal wetlands. The Virginia Wetlands Act defines tidal wetlands as "those vegetated and non-vegetated lands lying between and contiguous to mean low water (mlw) up to an elevation above mean low water equal to 1.5 times the mean tide range." The VMRC, under the authority of the Tidal Wetlands Act, seeks to preserve the Commonwealth's wetland resources in their "natural state" through avoidance and minimization. When loss is unavoidable, compensation, in most cases, is required. Policies regarding wetlands compensation and the creation, use, and operation of tidal wetland mitigation banks have been established by Commission regulation.

Like DEQ, on-site mitigation is preferred. Off-site mitigation within the same watershed is an option only when off-site is not possible. The compensation wetland should be designed to replace the functional values of the lost resource. A minimum ratio of 1:1 is required for vegetated and non-vegetated impacts. In addition, the VMRC stresses that when selecting a site, one aquatic habitat should not be sacrificed to create another. In some cases, tidal wetland mitigation bank credits may be purchased to satisfy required compensation. If a tidal wetland mitigation bank does not exist within the watershed, a compensation fee may be assessed. These fees should be used toward the future purchase or creation of a tidal wetland within the watershed.

3.3 Local Regulatory Authorities

Local regulatory authorities for wetland and water quality protection are generally codified in municipal zoning and land use ordinances. Local land use control policies are reflected in the municipality's Comprehensive Land Use Plan as well.

With regard to wetlands, Section 28.2-1302 of the Code of Virginia establishes a model tidal wetlands ordinance which selected localities below the Fall Line of Virginia are authorized to adopt and administer. This statute limits the authority of such boards to tidal vegetated and non-vegetated wetlands; however, the Local Wetlands Boards retain the authority to require wetlands compensation and take an active role in formulating and reviewing such compensation offers. Wetlands Boards are in place in both Chesapeake and Virginia Beach and have been among the most active in the Commonwealth of Virginia. These Boards routinely place compensation requirements on permittees.

Both municipalities have also enacted resource-specific ordinances. For example, the City of Virginia Beach currently has in place a floodplain ordinance, an erosion and sediment control ordinance, a stormwater management ordinance, and the Southern Watershed Management Ordinance. These ordinances restrict development within and adjacent to sensitive natural areas and are designed to protect water quality by buffering water sources from development impacts.

The Comprehensive Land Use Plan of the Chesapeake and Virginia Beach represent the land use goals for the municipalities and is the basis for the administration of zoning ordinances designed to implement those goals. Currently, both the City of Chesapeake and the City of Virginia Beach possess conservation/preservation zoning districts. Conditional use permits provide the municipality with additional leverage to negotiate use restrictions and enhancements on parcels to control land use and density patterns. For instance, a developer could be required to place a conservation easement over a significant natural resource on his parcel as part of the local zoning approval process. Currently, the City of Chesapeake requires a landowner to obtain a conditional use permit prior to converting an

agricultural property into a commercial mitigation bank. This allows the City to control the placement of mitigation banks within the municipality. Each municipality's Comprehensive Plan is summarized below as it relates to the MBCP.

3.3.1 City of Virginia Beach Comprehensive Land Use Plan

The City of Virginia Beach Comprehensive Plan was adopted in 1997. The Comprehensive Plan Map, adopted November 4, 1997, includes, among others, the following land uses:

- Agricultural/rural – "area planned for farming, forestry, rural residential and other rural compatible uses";
- Natural resource/conservation – "area consisting of (NWI) wetlands, sensitive soils, coastal dunes, and other natural features where land disturbing activities should be avoided, mitigated or under certain conditions prohibited";
- Open space/parkland – "area planned for outdoor recreation and leisure activities or aesthetic purposes"; and
- Historical/cultural – "areas designated with resources of historic or cultural significance".

The plan also establishes a "Green Line" south of which a "Transition Area" designed to protect the rural, agricultural, and natural resources of the Southern Watershed Area (SWA) is identified. Most of the land uses in the SWA are currently in agriculture, open space/parkland or the open water areas of Back Bay or the North Landing River.

The Virginia Beach Comprehensive Plan contains a Natural Resources Plan, which emphasizes a "systems approach" to natural resources protection (*City of Virginia Beach Comprehensive Plan*, 1997, pp. 184-250). The Virginia Beach Natural Resources plan represents a holistic approach to managing the City's natural and environmental attributes and provides a framework for land use decision-making in the SWA. The plan consists of the following MBCP relevant elements:

<u>Wildlife and Fisheries</u>

Visions:

- Extensive habitat and wildlife habitat is acquired through fee simple acquisition, and
- Critical woodland edges are established along stream corridors.

MBCP-relevant actions taken to date:

- Establishment of GIS-based priorities for candidate habitat restoration areas,
- Purchase of the CITYGreen software for determining the value of urban ecosystems,
- Preparation of a Natural Heritage Inventory, and
- Formation of a Habitat Enhancement Committee.

Future actions proposed by the 1997 Plan:

- Coordination of wetland mitigation and habitat needs,
- Continued public and private acquisition of sensitive lands,
- Continued cooperation between local, state, and federal land managers, and
- Development of programs and partnerships designed to voluntarily protect resources.

Surface Water Resources

Visions:

- Extensive riparian forests are established along shorelines,
- Wetlands are incorporated into stormwater retention ponds as a component of wetlands compensation associated with development projects, and
- Regional water quality programs are implemented which result in enhanced surface water resources.

MBCP-relevant actions taken to date:

- Adoption of various ordinances to control stormwater pollution, and
- Increased involvement in the SWAMP.

Future actions proposed by the 1997 Plan:

- Improved coordination of land use planning and stormwater management,
- Support for the development of watershed based plans, and
- Development of methods for conserving and enhancing stream corridor forest buffers.

Open Space

Visions:

- Back Bay National Wildlife Refuge is expanded, and
- Preservation Zoning is expanded City-wide.

MBCP-relevant actions taken to date:

- Development of the Virginia Beach Outdoors Plan,
- Implementation of the Agricultural Reserve Program,
- Adoption of policies designed to enhance the preservation of open space in residential zoning classifications, and
- Development of a new Open Space and Recreational Facilities Plan.

Natural Resources

Visions:

- Greenways and wildlife corridors are linked by preservation and open space holdings, and
- Natural heritage resources are protected.

MBCP-relevant actions taken to date:

- Development of a comprehensive inventory of environmental attributes,
- Acceleration of Habitat Conservation and Greenway Corridor Planning, and
- Implementation of a plan to serve as a model community for urban forestry.

Future actions proposed by the 1997 Plan:

- Identification of the need to maintain and establish stream corridors along the City's Scenic Waterway System including West Neck Creek and the North Landing River, and
- Enhancement of the preservation of agricultural soils and lands.

Within the Comprehensive Plan are Sector Plans, which outline the land use visions, goals, objectives and action plans for each sector. The Blackwater and Pungo Sector Plans cover much of the SWA.

3.3.2 City of Chesapeake Comprehensive Land Use Plan

The City of Chesapeake Comprehensive Plan was adopted in 1990. The plan contains general statements regarding the importance of preserving the environment of the City, especially the resources and water quality of the Northwest River, the City of Chesapeake's municipal water supply. When released, the plan placed significant emphasis on mapping the extensive wetland resources within the City. The document encourages development within the northern section of the City and the preservation of rural and agricultural characteristics in the southern portion of the City.

As part of the Comprehensive Plan, the City has developed the following planning principles for the southern section for the City:

- Sustain agriculture and promote open space,
- Maintain the area in a low density rural and natural setting,
- Withhold support for the extension of public water and sewer to the area,
- Preserve country roads,
- Preserve wetlands and hardwood swamps outside the Dismal Swamp area, and
- Protect the water quality of the Northwest River.

The City of Chesapeake will be updating its plan in 2001. The City has indicated that it plans to incorporate into the new Comprehensive Plan specific land use categories focused on resource preservation, lands capable of providing multiple benefits, and lands suitable for wetlands mitigation banks. The City has also recently adopted a Transportation Corridor Overlay District (TCOD), establishing future growth corridors within the City along Dominion Boulevard (VA State Route 104), Battlefield Boulevard (U.S. Highway 168), and George Washington Highway (U.S. Highway 17).

Since the issuance of the 1990 Comprehensive Plan, the City has initiated the following land use control initiatives affecting the MBCP:

- Refined a proffer policy as part of its growth management initiative,
- Issued a new zoning ordinance in 1993 creating four zoning categories (urban, suburban, countryside, and rural), and
- Adopted a rezoning requirement in 1995 requiring all requests to calculate the effect the rezoning would have on the level of service (LOS) of public facilities.
- Adopted strengthened stormwater management requirements.

3.4 Non-Regulatory Programs

The achievement of multiple benefits in conservation and compensation decisions can also be accomplished through non-regulatory methods. Private conservation entities play a vital role in wetlands and water quality protection through land acquisition, research, and education. Such entities include The Nature Conservancy, the Trust for Public Lands, the Isaac Walton League, and Ducks Unlimited. Additionally, federal, state, and local land acquisition programs for open space and recreational facilities programs bolster the ability of regulatory programs to protect and conserve water resources.

3.4.1 Federal Non-Regulatory Programs

Both the U.S. Department of the Interior and the U.S. Department of Agriculture acquire land, manage resources and provide technical and monetary assistance to landowners interested in conservation practices on their lands. Landowner assistance may result in long-term protection or enhancement of an existing resource or restoration of a previously degraded resource. Both entities also manage and protect significant resources through acquisition programs associated with National Wildlife Refuges, National Parks and Seashores, National Forests, Waterfowl Management Areas, and Wilderness Areas. Federal funds for land acquisition has been a key factor in the gradual expansion of the Back Bay National Wildlife Refuge through voluntary purchases of adjacent lands.

The U.S. Department of Defense has been a leader in the effective stewardship of natural resources within the confines of U.S. military installations. Natural resources personnel assigned to each military installation ensure that resources are managed to the maximum extent practicable without deterring the installation's mission. All major military installations currently have Natural Resources Management Plans in effect. Such plans are in effect for the U.S. Naval Air Station Oceana, Fleet Combat Training Center, Dam Neck, the U.S. Navy Northwest Radio Station in Chesapeake and the U.S. Navy Auxiliary Landing Field at Fentress in Virginia Beach.

3.4.2 State Non-Regulatory Programs

At the state level, the Virginia Department of Game and Inland Fisheries (VDGIF), the Virginia Department of Agriculture, Virginia Department of Forestry, and the Virginia Department of Conservation and Recreation (DCR) all administer the funds from several federal programs and provide additional assistance of their own. Soil and Water Conservation Districts, the Cooperative Extension Service, and the Forest Service assist landowners in responsible management of their land by providing cost-share funding, technical assistance, and educational resources. The VDGIF protects resources through acquisition and management of game lands.

The Division of State Parks (DSP) acquires and administers the State Parks Program. DSP manages False Cape State Park, a key resource within the southern watershed.

The quasi-governmental Virginia Outdoors Foundation accepts conservation easements, assists with land grants, and administers tax credits for private lands placed in perpetual conservation. All of these methods encourage responsible use of water resources and protect water quality.

The Virginia Natural Area Preserve System was established by the Department of Conservation and Recreation (DCR) to preserve some of the most significant natural areas in the Commonwealth. Of 30 Dedicated Natural Area Preserves, protecting 16,603 acres to date, the Department owns and manages 23 preserves. The remaining preserves are owned by local governments, universities, private citizens and a private conservation organization - The Nature Conservancy. The DCR Division of Natural Heritage (DHR) staff assists with management of all Dedicated Natural Area Preserves (see http://www.dcr.state.va.us/dnh/preserv.htm for additional information).
The DCR also administers the Virginia Outdoors Plan, which provides a mechanism for the establishment of conservation easements over certain lands.

3.4.3 Local Non-Regulatory Programs

As noted above, the Comprehensive Plans of Chesapeake and Virginia Beach provide guidance on the overall land use objectives of the municipalities. A key component of these plans are the open space and recreational plans developed by each city to guide land acquisitions and management.

Of particular importance to the MBCP is the recently released Virginia Beach Outdoors Plan, which identifies future outdoor and recreational facilities acquisitions in the SWA. The Virginia Beach Outdoors Plan provides guidance and an action plan for the preservation of important resources within the SWA for the physical and visual enjoyment of recreational and open space areas. The 2000 Update contains a plan for the Courthouse and Pungo/Blackwater Planning Districts, which together comprise most of the SWA in the City of Virginia Beach. A central objective of the 2000 Update is to develop a multi-purpose trail and greenway system connecting key recreational and open space resources within the City of Virginia Beach. Specific key objectives supporting the goals of the MBCP in each Planning District are listed below.

<u>Courthouse Planning Area</u>

- Acquire additional undeveloped land along the Indian River Road corridor as the central link to the Stumpy Lake/Back Bay greenway;

- Acquire additional land at the eastern terminus of Sandbridge Road to preserve open/beach area;

- Provide at least three scenic waterway accesses for non-motorized watercraft on existing public property on West Neck Creek, in the Shipps Corner vicinity, and at Lotus Garden Park;

- Preserve the natural character and environmental amenities at West Neck Creek District Park and preserve the greenway north of Shipps Corner Road;

- Coordinate the development and review interests to preserve the greenway corridor within environmentally sensitive areas parallel to West Neck Creek though enforcement of the Southern Watershed Management Ordinance, floodplain regulations, and jurisdictional wetlands boundaries; and

- Establish a trail system along such key roadway arterials in the SWA as North Landing Road, West Neck Road, Princess Anne Road, Nimmo Parkway, Judicial Boulevard and Holland Road.

<u>Blackwater/Pungo Planning District</u>

- Develop 21 miles of new multi-purpose shared trail systems for use by equestrians, bicyclists, and hikers along major road corridors such as Princess Anne, Indian River, Blackwater, and Pungo Ferry Roads;

- Continue the preservation of the West Neck Creek Greenway south for approximately two miles along West Neck Creek through a variety of implementation measures; and

- Develop three scenic waterway access sites on existing public property at Horn Point, Lovitt's Landing, and Pungo Ferry Road Bridge

The 2000 Update to the Virginia Beach Outdoors Plan contains an implementation strategy consisting of the following key elements:

- Development of new land use tools such as tree preservation and conservation ordinances;
- Revisions to existing land use ordinances such as the subdivision and stormwater ordinances to promote open space preservation;
- Enhanced coordination among city departments to increase open space preservation; and
- Coordination of CIP projects to promote open space preservation.

Exhibits showing the location of key planning objectives are contained in Appendix B. The report also identifies a number of potential funding mechanisms to achieve the open space objectives.

4.0 SOURCES OF DATA AND ASSISTANCE

The development and implementation of the MBCP would not be possible without a significant technical support and resource data from the municipalities, HRPDC and state and federal regulatory agencies.

4.1 Stakeholders

At the inception of the SWAMP, a group of stakeholders (parties with a key interest in the out come of the program) was established. During the course of the SWAMP, periodic stakeholder meetings have been held to review the progress of the SWAMP. Stakeholders have provided general guidance to the MBCP during the course of the study. The Stakeholder group consists primarily of the municipalities, the HRPDC, certain state and federal agencies and key interest groups.

4.2 Technical Advisory Committee

The Technical Advisory Committee (TAC) provided significant assistance and data during the course of the development of the MBCP. During the initial meetings, the goals and objectives of the program were reviewed and each agency outlined its role and the information and data it was prepared to provide HRPDC's consultants. The TAC also provided advice and guidance regarding the framework for the plan and played an important role in the need to link the conservation and mitigation programs into the MBCP.

The committee met on six occasions: December 13, 1999, and February 28, May 8, July 24, October 6, and November 6, 2000 to assist in developing the draft report. A summary of the meetings is contained in Appendix D.

Activities of the TAC included briefings on regulatory frameworks and development trends, identification of mitigation focus areas and site characteristics, review of Memoranda of Agreement, and guidance on preparation of reports. The goal of the TAC has been to assemble information useful in developing the MBCP.

An Information Exchange Memorandum of Agreement (MOA) was developed by the HRPDC to formalize the participation of the TAC members and secure a consensus on the principal objectives of the TAC. The Information Exchange MOA has been combined with implementation measures. A combined MOA is included as Appendix E.

Throughout this process, the TAC has been enthusiastic about working on the MBCP and supported its concept. The meetings were well attended and interactive, with many members providing input. Discussion identified areas of consensus and potential obstacles to implementation. All agreed that the compensation process needs to be made more effective and efficient, and there was general agreement that the development of an attribute based listing of focus areas with priorities for action was an appropriate approach to developing a MBCP. However, the regulatory agency participants emphasized the institutional and policy limitations to committing themselves to specific areas or non-wetland resources that must be used in compensation or conservation actions. The atmosphere of the meetings was positive with members agreeing on the limitations of the current compensation process. The Committee discussed possible policy considerations that might be examined in the future which could enhance the effectiveness of the compensation process by furthering the goals of multiple benefit achievement.

4.3 Geographic Information Systems

Utilization of Geographic Information System (GIS) data has been instrumental in the development of the MBCP. Development of these data and graphical resources was accomplished through cooperation between Chesapeake and Virginia Beach and the HRPDC. In doing so, differences between the two GIS of the municipalities were identified and, in some cases, resolved. TAC members, such as the Department of Conservation and Recreation, also provided key resource databases to the effort. The following lists detail the GIS layers developed for and utilized by the MBCP. Unless otherwise indicated, each data layer was available for both municipalities.

Data Layers Gathered and Developed by the HRPDC
Agricultural Reserve Program sites (Virginia Beach)
Soils Associations
Back Bay National Wildlife Refuge limits
Base Mapping
Comprehensive Plan land use categories
Military Aircraft Crash Zones
Existing Municipal and Private Mitigation Bank Sites
Location of Permits for Existing Septic Systems (Virginia Beach only)
FEMA Mapping (Virginia Beach only)
Forest Land Cover (GAP Analysis)
Hampton Roads Sanitation District (HRSD) Development Boundary (Chesapeake only)
Hydric Soils
Infrared Aerial Photography (Chesapeake only)
National Wetland Inventory Mapping
Real Estate Parcel Information
Public Lands Location

Surface Waters
Transportation Corridors – Road & Rail
U.S.G.S. Subregions
Virginia Beach "Green Line"
Virginia Beach "Transitional Area" Location
Zoning Classifications

Data Layers Provided by the Virginia Department of Conservation & Recreation
0.5-mile Radius Buffers around Rare & Protected Species
DCR Conservation Sites
Lands Owned by DCR and The Nature Conservancy
Infrared Aerial Photography of the North Landing River & Northwest River Sub-Watersheds

Data Layers Developed by LandMark Design Group, Inc. by Querying and Combining Certain of the Above Listed Layers to Determine the Location of Specific Types of Lands
100-year Floodplain (Virginia Beach only)
Agricultural Lands
City of Chesapeake Parks
City of Virginia Beach Parks & Recreation Areas
Condensed National Wetland Inventory Mapping with Broad Wetland Types
DCR Owned Lands (compilation of DCR data & city parcel data)
DCR Natural Heritage Species Occurrences by Taxon
False Cape State Park limits
Forested Areas within DCR Conservation Sites
Forested Wetlands
Mackey Island National Wildlife Refuge limits
Probable Prior Converted (PC) Croplands
Probable PC Croplands within DCR Conservation Sites
Probable PC Croplands within DCR Species Buffers
Probable PC Croplands within the 100yr Floodplain (Virginia Beach only)
Pocahontas Wildlife Management Area limits
Lands Owned by the Nature Conservancy (compilation of DCR data & city parcel data)
Wetlands within the 100-yr Floodplain (Virginia Beach only)

Data Layers Generated by the Technical Advisory Committee
Areas with Flood Control and Erosion Concerns
Areas with Water Quality Concerns
Canoe Trails
Green Sea State Scenic By-way
Habitat Corridors
Recreation and Environmental Education Facilities/Sites

4.4 Other SWAMP Initiatives Supporting the MBCP

Four other SWAMP program areas provided important data on water quality and natural heritage areas for the MBCP. These were:

1. *An Assessment of the Current Status and Long-Term Trends in Water Quality Conditions in the Southern Watershed Area* (Applied Marine Research Laboratory at Old Dominion University),

2. The *Conservation Plan for the Southern Watershed Area* (Virginia Department of Conservation and Recreation, 2000),

3. *A Strategic Plan for Agriculture in Chesapeake and Virginia Beach* (Virginia Polytechnic Institute and State University, 2001), and

4. The Rural Area Preservation Plan for the City of Chesapeake (Siemon & Larson and LandMark Design Group, 2001).

Reports have been submitted for initiatives one, two, and three above and data from these reports were utilized in preparing the MBCP. A summary of these programs follows.

4.4.1 Water Quality Conditions in the Southern Watershed Area

The AMRL report provides important guidance for the MBCP by identifying those areas where compensation measures containing conservation, preservation, and land use modifications can enhance water quality by reestablishing riparian buffers or inducing changes in land management practices.

Long-term trends in water quality conditions in the SWA were assessed by researchers at the Old Dominion University Applied Marine Research Laboratory (AMRL) in Norfolk, Virginia. The objective of this project was to determine the status of current water quality conditions in the Southern Watershed relative to historical records, nearby watersheds, human health, and ecosystem health. The study also identified long-term changes in water quality that would indicate improving or degrading conditions.

Samples were taken from six stations in northern Back Bay, five in southern Back Bay, 14 in North Landing River, and eight in Northwest River. From their results, it can be seen that no one sub-watershed met all of the established water quality goals. The Northwest River watershed has the best water quality with the largest percentage of monitoring stations supporting the water quality standards, meeting the goals, and maintaining a rating of "good" for various indicators. The North Landing River watershed sampling indicated that water quality in the River was inferior to that of the Northwest River. The Back Bay watershed contained the most problem areas (with the northern half of the watershed possessing marginally better water quality than the southern half). Findings from this study were presented at the November 18, 1999 Stakeholders Workshop and are summarized below.

<u>Northwest River</u>

Concerns:

- Status of dissolved inorganic phosphorus poor in the lower portion of the Northwest River
- State standard for pH only partially supported at half of the stations
- State standard for dissolved oxygen not supported at half of the stations

- No total suspended solids or dissolved inorganic phosphorus data for most stations
- State coliform standard not supported in Indian Creek
- Degrading trends in total Kjedhel nitrogen and total fixed solids at Route 168 Bridge station
- Insufficient data to assess trends at most stations

Improvements:

- Improving trends in nitrate and total suspended solids at Route 168 Bridge station

North Landing River

Concerns:

- Relative status of total suspended solids and dissolved inorganic phosphorus predominantly fair throughout
- State dissolved oxygen standard not supported or partially supported at half of the stations
- SAV goal for total suspended solids not met or borderline for most stations
- SAV goal for dissolved inorganic phosphorus not met at all stations with data
- State coliform standard only partially supported in Pocaty and Mill Dam Creeks
- Degrading trends in total Kjedhel nitrogen and total fixed solids in Middle and Lower West Neck Creek and at Route 190 Bridge
- Degrading trends in ammonia, nitrate, dissolved orthophosphate, and sulfate in Lower West Neck Creek
- Degrading trend in sulfate in Middle West Neck Creek

Improvements:

- Improving trends in total phosphorus at Route 165 Bridge
- Improving trends in nitrate, total organic carbon, and dissolved oxygen in Middle West Neck Creek
- Improving trends in total suspended solids and total organic carbon in Lower West Neck Creek
- Improving trends in ammonia and nitrate at Route 190 Bridge

Back Bay

Concerns:

- Status of dissolved inorganic phosphorus poor at all stations will data
- Status of total nitrogen and total suspended solids fair
- State dissolved oxygen standard not supported in Upper Nawney Creek
- SAV goals for total suspended solids and dissolved inorganic phosphorus not met at most stations
- State coliform standard not supported in Muddy Creek and at Upper Nawney Creek Mouth

- Total nitrogen, total phosphorus, and total suspended solids concentrations high relative to similar areas monitored by the Chesapeake Bay Program
- Degrading trends in total Kjedhel nitrogen, sulfate, and dissolved oxygen in Hells Point Creek
- Degrading trends in ammonia, total Kjedhel nitrogen, and total fixed solids in Upper Nawney Creek

Improvements:

- Improving trends in nutrients and suspended solids at many stations

The complete AMRL presentation delivered on November 18, 1999 is included as Appendix F.

4.4.2 The Conservation Plan for the Southern Watershed Area

The Virginia Department of Conservation and Recreation's Division of Natural Heritage submitted its *Draft Conservation Plan for the Southern Watershed Area* in September 2000. The purpose of the Conservation Plan was twofold: (1) to identify the most significant biological resources within the SWA and (2) to define the land areas necessary to sustain those resources.

The plan identifies *conservation sites* which are defined as "areas that support occurrences of rare plant and animals plus exemplary natural resource communities (DCR, 2000). These rare species and their habitats are in turn defined as *natural heritage resources*. The conservation site selection is supplemented by important summary information on the flora range of potential conservation corridors providing "connectivity" between major natural heritage areas. These corridors range from a "low density" option representing the current state of existing natural "bridges" between natural heritage sites to "high density" corridors representing an aggressive, long range program for re-establishment of natural "bridges" between natural heritage areas. Figure 2 depicts the high, medium, and low density DCR conservation corridors and conservation sites.

Acknowledging that the success of the conservation plan depends ultimately on "the ability of the citizens of Chesapeake and Virginia Beach to find a comfortable, sustainable balance between natural resources conservation and economic development", the plan also contains proposed implementation measures. The plan presents a variety of protection and land-use options for lands within the corridors and discuses some of the difficult management issues that future conservation planning will need to address. It also provides detailed descriptions of the conservation sites that form the core of the conservation corridors.

The principal benefit of the plan to the MBCP is the identification of important natural heritage areas within the SWA and the articulation of various options for habitat corridors to link these areas.

4.4.3 The Strategic Plan for Agriculture

A Strategic Plan for Agriculture in Chesapeake and Virginia was released by the Agricultural and Applied Economics and Biological Systems Engineering Departments of Virginia Polytechnic Institute and State University in January 2001. This report assesses the state of agriculture in the cities of

Chesapeake and Virginia Beach, summarizes the water resources and water quality of the SWA, and examines the effect on agriculture of expanding or re-establishing riparian buffers around the SWA waters by removing certain lands from agriculture.

Within the Environmental Assessment contained in the report is an assessment of the nutrient loading impacts to SWA waters from agricultural activities. The study examines distance of agricultural parcels from adjacent receiving waters as a measure of the importance of establishing such buffers and demonstrates that the preservation or re-establishment of buffers is not equally important around all riparian lands – a key finding for the MBCP. The study found that the majority of the 20 percent of parcels closest to open bodies of water are on the Pungo Ridge contributing non-point source pollution to both Back Bay and the North Landing River.

The study further found that the effect of reducing nitrogen and chemical use in "environmentally sensitive areas" reduces crop yield and some crops would be excluded from these areas. Under this scenario, farm revenues would decrease; however, since there are still adequate non-restricted areas in the region, the regional economic impact of imposing use constraints on environmentally sensitive croplands turns out to be minimal.

Although the finding has only broad application and does not consider the potential for certain areas to be ideally suited to specialty crops in low elevation areas with high water tables, the finding has general significance to the MBCP in that it indicates that many of the areas identified as having multiple benefits can be preserved or enhanced without significantly damaging the ability of agriculture to remain a viable enterprise in the SWA. It should be noted, however, that the soils types along the Back Bay are poorly drained soils with relatively high organic matter. These soils are unique in the Commonwealth and their conversion to wetlands should not be at the expense of specialty crops.

4.4.4 The Rural Area Preservation Plan

A key component of the Southern Watershed Area Management Plan is the Rural Area Preservation Plan (RAPP). The RAPP is designed to identify the rural attributes of the southern watershed which must be preserved for the maintenance of the rural character of the area. The Plan also identifies land use strategies and controls for preserving these attributes through presentation of a variety of alternative control measures.

The principal value of the RAPP is to provide guidance to the MBCP on those areas of the southern watershed where resource conservation, as supported through the wetlands compensation program can support the objectives of the RAPP.

5.0 THE MULTIPLE BENEFITS CONSERVATION STRATEGY

As stated earlier, the following five elements are essential to an effective MBCP:

1. Develop a process for information exchange through data and information sharing and the establishment of a forum for continued cooperation and support between municipal, regional, regulatory and resource agencies as well as private conservation organizations;

2. Identify focus areas for restoration, enhancement and preservation through land acquisition and other conservation measures which achieve multiple benefits;

3. Outline a site identification process, which allows for the identification of specific lands whose conservation or restoration achieves multiple benefits;

4. Identify potential wetland regulatory policies and measures which can assist in achieving multiple benefits;

5. Identify other non-regulatory measures capable of promoting the goals of the MBCP; and

6. Modify local land use controls and comprehensive plans to reflect MBCP goals and objectives.

A key element of the MBCP is the development of a method of identifying "focus areas" which provide initial guidance to wetland compensation offerors and reviewers in identifying sites with multiple benefits. In order to obtain the maximum benefits from these focus areas, a site search process was developed to further refine their use. The site search process guides individuals to conservation and compensation focus areas based on watershed (sub-watershed), impacted functions, and community type. It is a multi-step process that combines the efforts of the Virginia Department of Conservation and Recreation's Conservation Plan and the efforts of the MBCP Technical Advisory Committee.

5.1 Benefits of Focus Area Identification

A strategy of identifying "focus areas" for compensation and conservation opportunities (as opposed to targeting individual properties) was developed to (1) avoid the fears created by identifying specific parcels of land for long-term conservation actions and (2) to consolidate conservation efforts in an effort to maximize resources and benefits.

At present, conservation and wetland compensation properties are acquired in a scattered fashion. Conservation entities purchase lands as they become available to them, and pemittees acquire compensation based principally on cost and ease of acquisition. As such, lands acquired for compensation tend to be scattered throughout the landscape, often times in areas where proper management of the resources associated with those parcels is impractical. For instance, the opportunity may arise for a parcel of land to be acquired or conserved that contains a rare, fire-dependent community. However, because the parcel is surrounded by residential and commercial parcels, routine prescribed burning is not practical. The resources expended for this parcel might be better focused on an area of the same community type in an identified conservation focus area with fewer management restrictions.

Conservation and mitigation compensation properties are also often acquired in a manner inconsistent with overall municipal economic and development goals. Conservation easements are acquired by regulatory and resource agencies as the opportunity arises, and mitigation sites are purchased as they become available. However, the result may be a scattering of protected properties which conflict with a major transportation corridor, industrial center, or utility corridor that has been planned by the municipality for decades. If the same conservation easements and purchases had been directed to

approved conservation focus areas designed to provide multiple ecological and recreational benefits, water quality and economic viability could have both been retained and improved.

5.2 Focus Area Identification Methodology

The first step in the process of identifying focus areas was to identify the functions and values that compensation sites can provide. These functions and values were taken primarily from two sources: the hydro-geomorphic method, or HGM and the *Guidance for Rating the Values of Wetlands in North Carolina* (NCDEM, 1995). A matrix was developed that listed these functions and values with the objective of identifying focus areas possessing multiple functions and values, (i.e."benefits").

Identification of focus areas was performed by the TAC utilizing data gathered by the HRPDC and LandMark Design Group. During the third TAC meeting, members were divided into work groups based upon each member's knowledge and area of expertise in the southern watershed. Four groups were developed as follows:

- *Water Quantity* – Surface water storage, water supply protection, flood control/abatement, erosion control;
- *Water Quality* – Groundwater recharge, nutrient recycling, pollutant removal, water quality protection;
- *Habitat Protection* – Wildlife and aquatic habitat, protected species, management buffers; and
- *Recreation/education* – Recreation, education, and open space.

Each group was responsible for locating potential multiple benefit conservation sites that provided benefits specific to their group. In order to assist the groups in locating areas, base maps were developed from the available GIS data. These maps were developed by querying the available data layers to produce new independent layers. By doing so, comprehensive maps of natural resource related items could be developed to give an overall picture of the SWA.

The following base maps were produced and are included as Appendix G:

- *Currently Protected Lands* – Depicts city parks, public and private wetland mitigation bank sites, The Nature Conservancy holdings, state parks, DCR holdings, national wildlife refuges, and wildlife management areas;
- *National Wetland Inventory Mapping* – Depicts U.S. Fish and Wildlife Service National Wetland Inventory (NWI) data combined into seven broad categories: estuarine emergent, estuarine scrub/shrub, estuarine forested, palustrine emergent, palustrine scrub/shrub, palustrine forested, and open water;
- *Prior-Converted Croplands* – Depicts agricultural lands on hydric soils in an attempt to represent likely Natural Resources Conservation Service (NRCS) Prior-Converted (PC) croplands;

- *Resources within the 100-Year Floodplain (Virginia Beach only)* – Depicts both agricultural lands on hydric soils and NWI mapped wetlands that occur within the Federal Emergency Management Agency's (FEMA) designated 100-year floodplain in the City of Virginia Beach (ArcView data of FEMA mapping was not available for the City of Chesapeake);

- *DCR Critical Areas and Elements of Interest* – Depicts known locations of rare animal species, plant species, and natural communities as well as DCR conservation sites, planning boundaries, and special interest areas; and

- *PC Croplands within DCR Critical Areas* – Depicts agricultural lands on hydric soils that fall within DCR conservation areas, planning boundaries, and special interest areas as well as PC Croplands within 0.5 miles of known occurrences of federally protected species, rare species, and rare natural communities.

Each group drew their sites on these base maps, provided a written description of why each site was chosen, and presented their findings to the group. The principal result of the effort was a series of riparian-based focus areas containing the general attributes related to the restoration, enhancement, or preservation of each of the four main wetland function groups with opportunities to support the "greenways" habitat corridors identified in the DCR Report (Figure 3).

Areas with water quantity concerns (flood control and erosion concerns) were areas that experienced significant flooding during the hurricanes of 1999 and large farms with no vegetation along primary drainage channels. These areas tend to be located within the limits of the 100-year floodplain where soils and hydrologic conditions favor the existence of palustrine, scrub-shrub and emergent wetlands.

Areas with water quality concerns were typically those areas downstream of highly developed portions of the watersheds and areas around water supply waters where vegetated buffers have been removed or need to be preserved. Habitat and open space corridors generally occur along the major waterways and closely resemble the DCR medium-high density conservation corridor presented in the *Conservation Plan for the Southern Watershed Area*.

Finally, existing recreation and environmental education sites were documented so that compensation sites could enhance the existing facilities and/or provide links between facilities. The intersection of focus areas constitute potential conservation and compensation sites with maximum benefits. These "multiple benefit" areas are discussed in detail for each sub-watershed in Sections 5.3, 5.4 and 5.5.

Following identification of focus areas, the TAC then focused on characteristics that potential sites within a focus area should have to make them suitable for restoration, enhancement, or preservation of the particular function group of interest. All characteristics of potential sites submitted by committee members were discussed at the November 6, 2000 meeting and a list of agreed-upon characteristics was developed. The list was not intended to be exhaustive, but merely to be a guide of potential favorable characteristics. Stewardship opportunities for each of the function groups were also identified (Tables 1, 2, 3, and 4).

The focus areas were identified as follows:

5.3 Northwest River Multiple Benefit Focus Areas

In the Northwest River sub-watershed (Figure 4), opportunities for multiple benefit compensation sites occur primarily from the Virginia/North Carolina line northwest along the Northwest River and its tributaries to the Lake Drummond Causeway. The Northwest River is a water-supply watershed for the City of Chesapeake, and the area in question is primarily forested wetlands, low-density residential development, and agriculture. Canoe trails and forested wetlands in this area currently provide wildlife/aquatic habitat and recreation/education connections between the Great Dismal Swamp National Wildlife refuge and the Currituck Sound. Additionally, several rare plants, insects, and natural communities and three populations of protected species occur in the vicinity. Water quality, education/recreation, and wildlife/aquatic habitat would all benefit from the maintenance and re-establishment of vegetated buffers along open water channels in this area.

A second area with multiple benefit opportunities occurs in the western portion of the sub-watershed near U.S. Highway 17. Several large farms exist in this area that contain no vegetated buffers along ditches draining to the Northwest River and the area was a location of signification flooding during the 1999 hurricanes. This area is located on the canoe trail system mentioned above and re-vegetation of portions of this area could improve flood control, erosion control, and recreational/educational opportunities.

5.4 North Landing River Multiple Benefit Focus Areas

Several multiple benefit focus areas occur in the North Landing River sub-watershed – West Neck Creek, Stumpy Lake, and much of the area surrounding the North Landing River itself (Figure 5). Each of these areas is discussed separately below.

West Neck Creek

West Neck Creek can be divided into two areas, that portion south of Dam Neck Road and north of Indian River Road and that portion south of Indian River Road. The northern section of the creek is in a rapidly urbanizing area. Expansion of vegetated buffers along the creek will provide protected habitat corridors and buffer non-point source pollutants from urban run-off. The southern portion of the creek is in a low-density residential, forested, and agricultural area of the city. At present, forested buffers are principally intact on the eastern side of this section of the creek, but are more limited on the western side. AMRL recorded declining trends in water quality in the upper, middle and lower sections of West Neck Creek. Re-vegetation and protection of lands in this area will improve water quality in the North Landing River, enhance existing recreational/educational opportunities currently provided, protect wildlife/aquatic habitat, and protect population of DCR identified rare species.

Stumpy Lake

Stumpy Lake is a water-supply system for the City of Norfolk, which the City has agreed to sell to the City of Virginia Beach. Although currently surrounded by low-density residential development and forested wetlands, forested wetlands occur over a much smaller portion of the area than in the past. An environmental education center exists in this area as well as several populations of rare and protected

species. Existing forested wetlands around Stumpy Lake should be preserved and opportunities for improved buffers between existing residential run-off and the lake should be explored by the City in its management of the system.

North Landing River

An extensive canoe system occurs along the North Landing River. The DCR and The Nature Conservancy have acquired a number of key conservation parcels adjacent to the river along its length. The integrity of these parcels and the recreational/educational benefits of the existing canoe system should be preserved by providing additional vegetated buffers along the River and identifying opportunities for compensation sites adjacent to existing protected areas.

5.5 Back Bay Multiple Benefit Focus Areas

Multiple benefit focus areas occur principally in four locations in the Back Bay sub-watershed – Scopus Marsh, Asheville Bridge Creek, Hells Point Creek, and Nawney Creek (Figure 6).

Scopus Marsh

The upper limits of Scopus Marsh occur in a developed area bounded by Dam Neck Road, Great Bridge Boulevard, and Sandbridge Road. This area provides a non-point source buffer for run-off from the LagoMar and Ocean Lake developments and has historically contained water quality concerns associated with fecal coliform from former livestock operations. Vegetated buffers along Scopus Marsh are essential to improving and restoring water quality in this section of the sub-watershed and enhance the educational/recreational opportunities currently provided by the existing canoe system.

Asheville Bridge Creek & Hells Point Creek

South of Sandbridge Road, forested buffers along both Asheville Bridge Creek and Hell's Point Creek are nearly non-existent. An extensive canoe and park system occurs in this area, as do several rare plant communities. Re-establishment of these buffers would improve wildlife/aquatic habitat connections to Back Bay, provide buffers for non-point source agricultural run-off, and enhance the existing recreational/educational opportunities in the creeks.

Nawney Creek

The AMRL report recorded multiple water quality concerns in Nawney Creek. Additionally, although the creek itself is within the Back Bay National Wildlife Refuge, forested wetland buffers have been almost completely removed from the southern side of the creek downstream of Nawney Creek Road. To address water quality concerns and improve wildlife/aquatic habitat values in the refuge, re-establishment of forested wetland systems in the vicinity of this creek is imperative.

5.6 Site Search Process

Wetland compensation and conservation decisions require the identification of specific parcels for conservation actions to be effected. Accordingly, an effective mechanism must exist for identifying the

optimal focus area for a compensation or conservation action to an individual property. Accordingly, a "site search" process was developed which outlines the steps for doing so. The site search process is intended to guide individuals to focus areas based on sub-watershed, impacted functions, and community type. It is a multi-step process that combines the efforts of the Virginia Department of Conservation and Recreation's Conservation Plan and the efforts of the MBCP Technical Advisory Committee. The site search process is depicted in Figures 7 and 8.

The initial goal of the site search process is to ensure that compensation sites are located in the same sub-watershed as the impact so that lost functions are not re-located to another sub-watershed. As such, the first step of the site search process is to determine in which sub-watershed the impact, and thus the compensation, will occur – Northwest River, North Landing River, or Back Bay.

The nest step in the process is to determine the ecological community type being impacted and where that community type occurs within the identified focus area. The Virginia Department of Conservation and Recreation (DCR) has completed detailed community mapping for the Northwest River sub-watershed and has prepared broad-scale mapping for the North Landing River sub-watershed. An example of this mapping for the Northwest River from the *Conservation Plan* is included as Figure 9. Once this mapping and mapping for the Back Bay sub-watershed is completed, it will be an invaluable resource to the compensation and conservation site searcher. In the interim, the searcher must rely on his or her knowledge of the impact area and focus area and existing resources such as topographic quadrangles, NWI maps, and soil surveys to ensure that in-kind compensation is achieved.

The third step in the process is to determine what wetland/water functions are being lost or reduced due to the proposed impact(s) – water quantity, water quality, habitat protection, and/or recreation/education. Based on this information, the searcher can then narrow his or her search to one of the compensation focus areas depicted on Figures 4, 5, and 6 where the impacted function(s) is impaired or threatened. Following identification of the focus area, the searcher then refers to one of the Site Characterization Tables (Tables 1, 2, 3, and 4) to determine what characteristics a site within that focus area should have to adequately compensate for the particular impact in question and/or what stewardship measures may be taken to promote improvement of function at the impact site and the compensation site.

With the information outlined above in hand, a focused search for individual parcels based on the following factors can be initiated:

- Potential for the restoration of wetland hydrology
- Landscape position
- Ecological community
- Size and configuration
- Ownership and willingness to dispose of rights in the land or enter into conservation agreements
- Cost
- Permitting agency acceptance

6.0 POTENTIAL CONSTRAINTS TO IMPLEMENTATION

Implementation of a long-term multiple benefit conservation program for the SWA will require the participation of numerous local, state and federal agencies and departments. Implementation will be effected through a combination of voluntary, regulatory, and planning initiatives. Implementation will also be accomplished through individual decisions and modification of local and state comprehensive plans for both natural resources conservation and land use. Incentives for participation in an implementation program will be required along with readily accessible information on the purpose, location, and advantages of preserving, restoring, and creating natural resources conservation areas in accordance with an overall master plan. Finally, effective implementation will require the resolution of agency policy obstacles, especially with regard to the use of wetlands compensation as a vehicle for implementation.

There currently exist a number of constraints to the long-term effective implementation of the MBCP. Among these are development pressures, landowner participation, community acceptance, regulatory policy, and information availability. Each of these constraints can be overcome with thoughtful planning, outreach initiatives, and flexibility.

6.1 Development Pressures

The long-term success of the MBCP will depend, in part, on sufficient time being available for implementation. While effectively planned and controlled development can be an important vehicle for accomplishing the goals and objectives of a multiple benefits conservation program, uncontrolled or poorly planned development can preclude future conservation actions. Accordingly, limitations on development pressure are essential to create the timeframe within which the variety of implementation actions can be affected.

The City of Virginia Beach has adopted a Comprehensive Plan that calls for retaining the rural character of the SWA through both zoning and the implementation of the Agricultural Reserve Program. The City is currently using a number of growth control initiatives such as density measures, conditional use permits, floodplain ordinance controls, the Southern Watershed Management Area stormwater controls, and traditional zoning measures to restrain development below the "transition area" identified in the Comprehensive Plan. Additionally, the City has reviewed its capital facilities plans specifically limiting roads and utility development in the SWA to those areas whose resultant growth would be consistent with the Comprehensive Plan.

The City of Virginia Beach has also adopted voluntary conservation measures such as the Agricultural Reserve Program (ARP) that seek to create incentives for the purchase of development rights to agricultural lands. While the objective of the ARP is to facilitate the continued existence of agriculture in the SWA, it nonetheless provides an important vehicle for the acquisition of key properties in multiple benefit focus areas. The areas acquired by the ARP can provide open space, wildlife and aquatic habitat, management buffers and, when managed appropriately, water quality protection and buffers to protected lands and potential compensation sites.

The City of Chesapeake, faced with differing economic necessities, has not yet developed either its long-term goals or comparable land use controls and incentives. However, in 2001 and 2002, the City will be developing a new Comprehensive Plan that will specifically address both the rural character of the SWA of the City as well as establish the goals and objectives for identifying and preserving key natural resources. The plan will also specifically address wetland compensation objectives for the City and measures to implement the goals and objectives of a natural resources conservation plan (*Jaleh Pett, City of Chesapeake, personal communication*).

Development pressures will continue in both cities in the SWA as competition for scarce land resources within the two municipalities increases, especially for residential home sites. However, effective land use tools, combined with land planning techniques, which create economic incentives for developers to preserve key natural areas and redirect growth away from or around such areas, may ease the pressure on important natural resources and designated greenways so that over time such areas can be acquired or otherwise preserved.

6.2 Landowner Participation

Voluntary participation of landowners in foregoing development rights or modifying land use practices can be a key tool to accomplishing the objectives of the MBCP. While some landowners may be motivated to voluntary actions by altruistic notions, most will participate in such programs based on economic considerations. However, in many cases sufficient economic incentives do not exist to overcome the uncertainty and potential cost to landowners to forego development rights or to modify land use practices. Only through increases to the financial incentives for such voluntary measures or a decrease in the likelihood of substantial economic return from the sale of land for development will the level of participation in voluntary programs increase. Financial incentives may include the following:

- Purchase or transfer of development rights through such programs as the Agricultural Reserve Program,

- Tax incentives for land use modifications such as provided by Virginia Outdoors Foundation and local real estate tax programs designed to encourage land conservation,

- Creation of economic incentives through preservation and restoration of wetlands such as through wetlands mitigation banking and the purchase of mitigation sites, and

- Federal and state cost-share monies for conservation oriented agricultural and silvicultural activities.

A decrease in the likelihood of development windfalls may be accomplished through the above enumerated land use controls. The level of voluntary participation in the MBCP will also be a function of the degree to which each locality develops a focused and directed program of information, education, and outreach for rural and suburban landowners on the benefits of such voluntary participation.

6.3 Community Acceptance

Community acceptance of the goals and objectives of the MBCP is an essential component of its long-term success. Such acceptance can only be garnered through the adoption of a plan that meets the legitimate interests of all stakeholders without compromising the goals and objectives of the program. Among the essential stakeholders whose views need to be considered and accommodated are developers, especially homebuilders, existing residents, agricultural interests, taxpayers, economic development interests, and conservation and environmental organizations. The most effective forum for balancing such interests is through the Comprehensive Planning effort such as that which is about to be initiated in the City of Chesapeake or through other program-specific public participation measures. For any multiple benefits conservation plan to succeed, the following must be assured:

- Developers must feel that the program will not preclude reasonable residential development,
- Economic development interests must feel that sufficient land will be available for future economic development,
- Agricultural and silvicultural interests must see that their industries will not be compromised, and
- Taxpayers must be willing to shoulder additional tax burdens to fund the program.

6.4 Regulatory Policy and Flexibility

A principal vehicle for implementing the MBCP is the compensation component of wetlands regulation programs. Such programs are administered through Sections 401 and 404 of the Clean Water Act and the Virginia Water Protection Permit regulations issued pursuant to the State Water Control Law. These programs require "compensation" for unavoidable wetland impacts in the form of wetlands creation, restoration, enhancement, and/or preservation.

Although the U.S. Army Corps of Engineers has recently recognized the value of non-wetland riparian buffers in its Nationwide Permit program, federal and state wetlands compensation guidelines however, may otherwise limit the ability to substitute the acquisition of important non-wetland attributes for wetlands functions. Current state and federal wetlands compensation guidelines require conformance to a "no net loss" policy of wetlands replacement keyed to specific replacement ratios and on-site, in-kind wetlands replacement wherever possible. Generally, non-wetlands resources cannot be used as compensation for wetlands losses. Accordingly, the use of permit-based compensation measures may have limited applicability to the preservation of resources which are not wetlands or do not constitute wetlands restoration. However, flexibility in regulations to ensure no-net loss but provide the remainder of the compensation requirement in riparian buffers, upland buffer, and critical habitat areas can go a long way in implementing the MBCP.

6.5 Information Availability

A principal limitation to the achievement of MBCP goals has been the lack of availability of comprehensive information on the nature and location of areas containing multiple benefits and the

means to effectively share such information. While municipal comprehensive land use plans have identified areas classified as conservation areas and various state agencies have identified resources whose preservation is important, there has been no set of goals and objectives for such resources or a central repository of data or information for the identification of multiple benefit conservation sites. This lack of information is clearly evidenced by the duplication of efforts characteristic of the formation of compensation offers for wetlands permittees. Such permittees must identify wetlands compensation sites for each permit. Site searches frequently cover territory already screened by other potential permittees but for which no effort has been recorded. Consequently, there is a considerable duplication of effort in the compensation site search effort. Coupled with the duplication have been the lack of information on the location of multiple benefits conservation sites and the lack of an effective database for both searching for and recording the existence of such areas. This report and the emergence of Geographic Information Systems (GIS) within municipalities and state and federal resource and regulatory agencies presents an opportunity to overcome this deficiency, but only if the development of GIS-based databases are coordinated among the entities in a position to facilitate or promote the implementation of the MBCP. Accordingly, the development of effective data sharing measures and a centralized or networked data storage and retrieval system readily accessible to the public will be essential to the successful implementation of the plan.

7.0 IMPLEMENTATION AND STEWARDSHIP MEASURES

Possible implementation measures have been grouped into local, state and federal regulatory and non-regulatory measures. Appendix H provides a listing of potential public and private funding sources for achieving implementation of the MBCP.

7.1 Regulatory Programs

The administration of the Clean Water Act and the State Water Control Law offer the principal vehicle by which the objectives of the MBCP can be achieved. Specific actions which can be taken in administering these programs to further the goals of the program are listed below.

1. Enter into an Information Sharing and Implementation Memorandum of Agreement (MOA)

   A draft of this MOA is included as Appendix E. Signatories to the MOA agree to the following:

   - To commit to the goal of achieving multiple benefits in wetlands compensation decisions;
   - To meet quarterly to share information on pending wetland compensation projects, discuss issues related to MBCP objectives and assess progress on achieving these objectives.
   - To work toward a shared database and GIS systems to improve efficiency and effectiveness of the compensation site selection process utilize the information contained in this and other data sources when formulating or reviewing wetland compensation offers;
   - To recommend the selection of compensation sites that contribute to building the riparian corridor system identified in maps in this report.

- To develop a process by which to track/benchmark progress through periodic reviews of, and revisions to, the Plan.

2. Coordinate the Development of the Norfolk District, Corps of Engineers GIS with those of the VDEQ, HRPDC and the Cities of Chesapeake and Virginia Beach.

   GIS resources are a key means of rapidly localizing searches for compensation sites. Currently, the Norfolk District of the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality are developing GIS to support agency planning and regulatory programs (Appendix I). While each GIS is designed for somewhat different purposes and covers different geographic areas, the development of each program at this time offers important opportunities for cooperation and information sharing.

   The USACE GIS is expected to be operational during the first half of 2001. Initially the GIS will be for internal use only; however, the USACE is examining procedures by which such information could be made available to other users.

   VDEQ is in the early stages of developing a GIS focused on water quality information. As the Commonwealth currently intends to seek a State Programmatic General Permit from the USACE in order to assume a lead role in wetlands permitting, the development of a comprehensive GIS will be important to assuming such a role. Cooperation between VDEQ and the USACE to date has been limited, but there is significant opportunity for data sharing.

   Chesapeake and Virginia Beach already have established GIS with information that can be provided to the VDEQ and USACE. Data from the two systems should be accessed by and made available to the USACE in the development of its data for the SWA.

3. Assist in Securing Funding for the Completion of Community Mapping for the Remaining Portions of the Southern Watershed Area.

   Ecological community mapping can be an important tool in locating specific parcels for conservation or compensation decisions. “Scalable” community mapping is presently only available for the Northwest River. The Virginia Department of Conservation and Recreation has developed community maps on infra-red aerial photography for the Northwest River as an aid to conservation decisions (Figure 9). The community exhibit uses color infrared photography, digitally ortho-rectified with 2meter pixels at 1:12,000 scale. DCR digitized the community type based on knowledge of ground conditions, published data and photo-interpretation.

   Aerial imagery exists for the North Landing River but not for the Back Bay system. Such imagery has been estimated to cost between $5,000 and $10,000 (DCR, letter of February 22, 2001). Mapping of the core wetlands communities adjacent to the three principal drainage systems of the Southern Watershed is estimated to cost between $110,000 and $140,000. As an initial tool for increasing wetlands compensation effectiveness funding for the development of this tool should be identified as soon as possible.

As a long term objective, such mapping resources should be developed for the entire southern watershed. DCR has estimated that providing hyper-spectral data for the entire watershed would cost between $200,000 and $250,000 (DCR letter of February 22, 2001).

4. Utilize MBCP Data in Compensation Site Identification and Compensation Offer Evaluations

USACE and VDEQ personnel should actively promote the goals and objectives of the MBCP by (1) providing permit applicants guidance on compensation site selection when appropriate and (2) using the MBCP results along with subsequent information to evaluate the acceptability of compensation site offers. Permit applicants frequently consult the USACE in formulating their compensation offers. This provides an opportunity for agency representatives to expose applicants to the MBCP concept and supporting data. While each compensation decision must rest on its own merits and meet state and federal compensation requirements, this interface offers the opportunity to steer applicants to MBCP focus areas, furthering program goals.

5. Increase Consultation with State and Local Planning and Resource Agencies in Evaluating Compensation Offers

While land availability (willingness to sell and price) will always dictate compensation options, increased communication between the SWA cities (Chesapeake and Virginia Beach) and the USACE and VDEQ regarding compensation decisions, especially on major decisions such as those associated with transportation projects, will ensure that municipal views are reflected in wetland compensation decisions. Conversely, the Cities of Chesapeake and Virginia Beach must periodically communicate their resource preservation and open space/recreational priorities to the agencies and discuss how these priorities can be accommodated or promoted in the regulatory process.

6. Participate in Refining MBCP Program Features and Evaluating Program Effectiveness

The USACE and VDEQ should agree to participate in a MBCP Working Group assembled under the auspices of the HRPDC as part of the SWAMP implementation for the following purposes:

- Share additional data resources;
- Assist in projecting future wetlands impacts within the SWA and identify potential compensation sites for such impacts;
- Consult with localities on the development of municipal wetland compensation banks;
- Examine (and if necessary modify) agency policies, which tend to retard the accomplishment of the program goals (discussions should be initiated on methods for increasing flexibility in compensation decisions while still maintaining compensation goals); and
- Examine methods to allow non-USACE personnel access to its GIS system to facilitate the identification of wetland compensation sites.

7.2 Federal and State Land Acquisition and Management Programs

The principal federal land management agencies in the SWA are the Department of the Interior's U.S. Fish and Wildlife Service (USFWS) and the Department of Agriculture's Natural Resources Conservation Service (NRCS)

7.2.1 U.S. Fish and Wildlife Service Initiatives

Of their activities, the greatest opportunity for land acquisition compatible with the goals of the MBCP lies in the USFWS's land acquisition plans for the expansion of the Back Bay National Wildlife Refuge (NWR). The USFWS has been reorganized based on watersheds into Ecosystem Teams. Back Bay National Wildlife Refuge is part of the Roanoke-Tar-Neuse-Cape Fear EcoRegion. A 40,000 square mile ecoregion with 59 federally listed species that includes Back Bay and Great Dismal Swamp NWRs in Virginia and North Carolina and Mackey Island, Currituck, Alligator River, Pocosin Lakes, Swanquarter, Mattamuskeet, Roanoke River, Pea Island, and Cedar Island NWRs in North Carolina.

Each EcoRegion Team is undertaking a Resource Conservation Initiative (RCI) to develop a conservation plan. The EcoRegion Team in which Back Bay is a part of started its RCI last year and began gathering data about the location of its resources. They are currently on Year One of a five-year planning process. As part of the RCI, the USFWS is trying to obtain additional funding to bring the Virginia GAP data up to par with the North Carolina GAP data to achieve a consistent community map throughout the ecoregion.

The first objective of the EcoRegion Team was to determine the main threats to biodiversity in the ecoregion. These were determined to be habitat loss, fragmentation, predation by cowbirds, construction, new clearing of land for agriculture, and industrial activity. This ecoregion will have a web site in the coming months which details the status of the Resource Conservation Initiative for this ecoregion – www.rtncf-rci.com.

Focus areas were developed within the ecoregion in 1996. Approximately one year later, Congress passed the National Wildlife Refuge System Improvement Act, mandating that each NWR prepare a Comprehensive Conservation Plan (CCP) with full National Environmental Policy Act (NEPA) compliance. Each CCP will have a 15-year planning horizon. There will be a single NEPA document for each NWR as well as additional NEPA documents for refuge clusters (ex: Cluster 1 - Alligator River, Pocosin Lakes, Swanquarter, and Mattamuskeet NWRs; Cluster 2 – Back Bay, Mackey Island, and Currituck NWRs). These clusters have been developed because the long-term goal of the USFWS is to join together the NWRs within each cluster, either through fee-simple acquisition or through easements. The purpose of the NEPA compliance is to obtain substantial public involvement to ensure that these plans fit into the landscape for which they are developed. Scoping meetings for the Back Bay NWR CCP are planned for early winter of 2000/2001.

7.2.2 Natural Resources Conservation Service Initiatives

There are a number of federal land acquisition programs capable of supporting the MBCP which are overseen by the NRCS and administered by the Virginia Department of Conservation and Recreation's Soil and Water Conservation Districts. Principal among these are the Wetlands Reserve Program (WRP) and Conservation Reserve Enhancement Program (CREP). These programs provide funding and technical assistance for the restoration of wetlands and wildlife habitats, particularly the reversion of agricultural lands that were converted from wetlands through ditching and draining. The WRP and CREP hold significant promise for use as vehicles to promote the restoration of riparian buffers along the three principal waterways of the SWA through financial incentives for the cessation of farming activities in prior converted croplands.

7.3 State Land Acquisition and Management Programs

The Commonwealth of Virginia operates a number of state land acquisition programs which have the capability to support the MBCP. The Division of State Parks, Virginia Department of Game and Inland Fisheries and Department of Conservation and Recreation offer opportunities for fee-simple land acquisition supportive of the MBCP. While funding for such acquisitions has been limited in recent years, any future acquisitions should be made with the objectives of furthering the MBCP goals.

The *Conservation Plan for the Southern Watershed* prepared by the Virginia Department of Conservation and Recreation lists a number of state programs and methods other than fee simple acquisition available for acquiring or protecting multiple benefit sites, including:

- Natural Area Management Agreements – These agreements are voluntary agreements with private property owners, which state land management objectives, which are compatible with natural areas;

- Natural Area Registry – The Natural Area Registry is a voluntary protection tool adopted by landowners to protect significant natural resources through agreements to inform the DCR of potential threats to key natural resources within their property boundaries;

- Natural Area Dedication – This program is a legal process in which the landowner restricts future used of a property for the purpose of preserving the land in its natural state; and

- Research Natural Areas and Special Management Areas - These designations, entered into voluntarily with property owners, allow research and special management activities to take place in key resource areas without changing ownership.

7.4 Municipal Programs

The municipal governments of Chesapeake and Virginia Beach undertake a variety of activities that can support the MBCP including comprehensive planning efforts, zoning decisions, floodplain, buffer and water quality ordinance administration, land and development rights acquisition programs, capital improvement projects, and land use taxation policies.

7.4.1 Planning Efforts

The City of Chesapeake should include in its proposed Comprehensive Plan the following elements:

- Incorporation of MBCP areas and designation of such lands as a priority for future conservation natural resources category,
- Identification of existing wetlands compensation banks,
- Identification of potential wetland compensation bank sites,
- Specific policies promoting the acquisition of MBCP lands in compensation plans for municipal capital projects having unavoidable wetlands impacts, and
- Promotion of advance identification measures to ascertain wetlands impacts from projected capital projects and locate the potential sites to compensate for such impacts.

The City of Virginia Beach should develop policies as an adjunct to its Comprehensive Plan addressing the same issues discussed above.

7.4.2 Zoning and Land Use Restrictions

The cities of Chesapeake and Virginia Beach should continue to use the opportunity presented by the proffer system in rezoning matters to identify and encourage applicants for re-zonings within or adjacent to MBCP areas (both wetland and non-wetland) to preserve such areas through conservation easements or declarations of restrictions attached to zoning approvals. This technique has proven effective in preserving wetlands in re-zonings of lands adjacent to the principal watercourses of the SWA while offering applicants incentives to do so through increased densities on remaining portions of the property.

The floodplain ordinance of the City of Virginia Beach has the potential to be an important tool in supporting the objectives of the MBCP by working with property owners to dedicate or place conservation easements over those areas of floodplains that cannot be developed in conformance with the City's floodplain ordinance and that are not otherwise covered in wetlands conservation easements.

7.4.3 Land and Development Rights Acquisition Programs

The open space acquisition and management programs of the two municipalities offer significant opportunities to both identify and acquire MBCP lands if sufficient funding is committed to the programs. As discussed earlier, the City of Virginia Beach has recently completed an Outdoors Plan which identifies certain lands for acquisition in the SWA. This plan offers insight into the City's priorities with regard to open space, parks, and recreation. The land acquisition program that will be initialed pursuant to it offers opportunities for additional land preservation and conservation in the SWA.

As discussed earlier, the City of Virginia Beach has also adopted the Agricultural Reserve Program (ARP) to create incentives for the purchase of development rights to agricultural lands. While the objective of the ARP is to facilitate the continued existence of agriculture in the SWA, it nonetheless provides an important vehicle for the acquisition of key properties in multiple benefit focus areas. The areas acquired by the ARP can provide open space, wildlife and aquatic habitat, management buffers and, when managed appropriately, water quality protection and buffers to protected lands and potential compensation sites.

7.4.4 Capital Improvement Projects

The Cities of Chesapeake and Virginia Beach maintain multi-year Capital Improvement Project (CIP) projections for the purposes of prioritization and budgeting. These plans typically cover roadway, utility, school, and open space/recreational land development and acquisition. The Cities can use utilize the process involved in their CIPs to further the objectives of the MBCP by taking the following actions:

1. Conduct an annual assessment of capital and facilities maintenance projects for projected wetlands impacts – CIP programs should be reviewed for roadway, utility, building and parks construction to determine if any of the projects have projected wetlands impacts. The wetlands projected to be impacted should be classified by type according to the Cowardin classification system or, preferably, DCR community type, and organized by sub-watershed;

2. Conduct an initial site search for prospective wetland compensation sites – The municipalities of Chesapeake and Virginia Beach should initiate a site search process to identify candidate sites for compensating for the above-identified impacts. The option of a mitigation bank from which to draw credits for as yet unidentified wetland impacts versus a multiple-project site for several project specific wetlands impacts should be reviewed. Each option offers the municipalities unique flexibilities.

3. Develop municipal wetland mitigation banks or multiple project sites in advance of project specific needs – The City of Virginia Beach has developed the 70.3-acre Creeds Airfield Wetland Mitigation Bank in the Creeds Section of the Back Bay sub-watershed. The bank offers restoration and preservation compensation for wetland impacts associated with Public Works projects in the SWA. The Development Plan for the Creeds Bank was signed by the interagency Mitigation Bank Review Team in 1998 and states that the Bank contains 32.2 credits. Current estimates indicate that available credits should satisfy City compensation needs in the SWA for the next eight to ten years, after which a new bank or additional consolidated sites will be required. However, with reduced thresholds for compensation under the USACE and VDEQ permitting programs, the useful life of the Creeds Mitigation Bank may be shorter. Additional wetlands compensation banks may be required in the future to accommodate increased requirements for compensation from City projects.

   The City of Chesapeake has recently formed a Wetlands Advisory Task Force, which is currently examining the advisability of developing one or more wetlands mitigation banks to serve the SWA and Chesapeake Bay watersheds. This Task Force is examining the full range of options available to it including municipal wetlands banks, multiple-project sites, and

reliance on private mitigation banks. A site search was conducted for projects in the 1994 Capital Facilities Bond Referendum; however, this search did not yield a sufficient group of suitable candidate sites. Identification of multiple project sites will require advance consultation with permitting agencies and landowners to ensure the suitability and availability of such sites at the conclusion of permitting efforts.

Site selection of consolidated compensation sites and banks should be undertaken utilizing the focus areas listed in the MBCP as a point of reference to ensure that multiple benefits are achieved in such site selection.

7.4.5 Land Use Taxation Policies

Land use taxation policies can have an important effect on land conservation measures. The principal areas of land taxation affecting conservation incentives are land valuation, rollback taxes and tax rebates. Both the Cities of Chesapeake and Virginia Beach offer valuation reductions for confirmed jurisdictional wetlands with little potential for development.

7.5 Non-Governmental Land Acquisition and Management Programs

Acquisition of natural resources, especially wetlands, in the major drainage areas of the SWA has been a key factor in the preservation of wetlands and potential multiple benefit areas. For example, The Nature Conservancy, working with its own funds and those made available to it through the Virginia Wetlands Restoration Trust Fund, has acquired major tracts of land in the North Landing River sub-watershed. Accordingly, acquisition of key resource lands by private conservation agencies has a significant potential for supporting the MBCP outside of the regulatory process. A number of private organizations hold land in the SWA for conservation purposes or have programs for acquiring such lands. Among the more prominent of these are the Isaac Walton League, The Nature Conservancy, Ducks Unlimited, and the Trust for Public Land.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The following represent the findings of the MBCP:

1. There is a need for greater effectiveness and efficiency in wetland compensation location decisions;

2. Potential wetland compensation sites exist that can provide multiple benefits to the community;

3. These areas primarily form riparian corridors along the three main water bodies of the region;

4. Regulatory and non-regulatory options exist for implementation and can be combined to ensure the success of the plan;

5. Support exists for mutual cooperation between SWAMP stakeholders (i.e. local and regional governments, state and federal agencies and private parties); and

6. The goals of the MBCP can be accomplished without conflicting with other SWAMP elements or economic development.

At present, several limitations exist to the full implementation of the MBCP, chief among there are as follows:

1. Limited GIS data exists for natural resources decisions. Many of the key pieces of data needed to make informed compensation decisions exist as paper resources only;

2. Inconsistencies between GISs are common as different entities have rarely established their systems on the same datums using the same layering conventions; and

3. There is little coordinated information exchange between stakeholders.

The Memorandum of Agreement contained in Appendix E and Section 7.1 of this report represents the actions which should be initiated to achieve the objectives of the MBCP. These actions will be under review by the SWAMP participants and the TAC for a determination as to the most effective means of implementation and the level of participation by each SWAMP Stakeholder or TAC participant.

9.0 DEFINITIONS

CATALOGING UNIT – the eight digit designation describing a portion of a watershed displayed on the U.S. Geological Survey "Hydrologic Unit Map" as a cataloging unit.

COMPENSATION - "actions taken which have the effect of substituting some form of wetland resource for those lost or significantly disturbed due to a permitted development activity; generally habitat restoration or creation" †.

CONSENSUS - "a process by which a group synthesizes its positions to form a common collaborative agreement acceptable to all members. While the primary goal of consensus is to reach agreement on an issue by all parties, unanimity may not always be possible" * †.

CREATION - "the establishment of a wetland or other aquatic resource where one did not formerly exist"*; the establishment of a functional tidal wetland where one did not formerly exist" †.

CREDIT - "a unit of measure representing an accrual or attainment of aquatic functions at a mitigation bank" * †.

ENHANCEMENT - "activities conducted in existing wetlands or other aquatic resources which increase one or more aquatic functions"*; activities conducted in existing wetlands which increase one or more wetland functions" †.

FUNCTIONS - the physical, chemical and biological ecosystem processes of a wetland without regard to their importance to society; "any one of the following five commonly recognized benefits provided by tidal wetlands: production and detritus availability, waterfowl and wildlife utilization, erosion buffer, water quality control, flood buffer" †.

IN-KIND - the replacement of a specific wetland "class"‡ with the same "class"‡ such that the hydrologic and geomorphic conditions and the biotic components are similar. This assures that the wetland being impacted is replaced by similar processes, structure and surface area.

MITIGATION - "sequentially avoiding impacts, minimizing impacts, and compensating for remaining impacts"*; "all actions, both taken and not taken, which eliminate or materially reduce the adverse effects of a proposed activity on the living and nonliving components of a wetland system or their ability to interact" †.

MITIGATION BANK - a site or sites "where wetlands and/or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources"*. A mitigation bank may contain one or many mitigation bank sites (MBSs), each of which has its own individual service area.

MITIGATION BANK SITE (MBS) - a particular site "where wetlands and/or other aquatic resources are restored, created, enhanced, or in exceptional circumstances, preserved expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to similar resources"*. A mitigation bank may contain one or many mitigation bank sites (MBSs), each of which has its own individual service area.

OFF-SITE - not located within or contiguous to the boundaries of the project site.

ON-SITE - located within or contiguous to the boundaries of the project site and located within the same U.S.G.S. cataloging unit.

OUT-OF-KIND - the replacement of a specific wetland "class"‡ with a different "class"‡.

PRACTICABLE - "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes" * †.

PRESERVATION - "the protection of ecologically important wetlands or other aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms"*†. "Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection and/or enhancement of the aquatic ecosystem" *.

RESTORATION - "re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where they have ceased to exist, or exist in a substantially degraded state" * †.

SERVICE AREA - "the designated area wherein a bank can reasonably be expected to provide appropriate compensation for impacts to wetlands and/or other aquatic resources"*†.

SOUTHERN WATERSHED AREA – 380 square mile area of southeastern Virginia consisting of those portions of the Cities of Chesapeake and Virginia Beach, Virginia that drain into North Carolina through Back Bay, North Landing River, and Northwest River.

SOUTHERN WATERSHED AREA MANAGEMENT PROGRAM – The Southern Watershed Area Management Program is a collaborative effort involving the Virginia Coastal Program, the HRPDC and the cities of Chesapeake and Virginia Beach. The goal of the Program is to protect and enhance the natural resources, sensitive lands and water supplies of the Southern Watersheds of Chesapeake and Virginia Beach while allowing the cities to meet their economic and residential development needs.

VALUE - wetland attributes that result from or are influenced by wetland structural factors and ecosystem functions and which are considered beneficial to society.

WETLANDS -

(A) defined by Federal regulation at 33 CFR Part 328.2(b) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include: swamps, marshes, bogs, and similar areas";

(B) defined (in reference to tidal wetlands) at Chapter 13 of Title 28.2 of the Code of Virginia as "both vegetated and non-vegetated wetlands"

1. "non-vegetated wetlands" are therein defined as "unvegetated lands lying contiguous to mean low water and between mean low water and mean high water", and
2. "vegetated wetlands" are therein defined as "lands lying between and contiguous to mean low water and an elevation above mean low water equal to the factor one and one-half times the mean tide range at the site of the proposed project in the county, city, or town in question and upon which is growing any of…[37 specified] species".

* As defined in the *Federal Guidance for the Establishment, Use, and Operation of Mitigation Banks* (FR V.60 No. 228, November 28, 1995).

† As defined in the *Guidelines for Establishment, Use, and Operation of Tidal Wetland Mitigation Banks in Virginia* (4 Va. Admin. Code 20-391-10 *et seq.*)

‡ As defined *in* Cowardin, L.M. et al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, Office of Biological Services. U.S. Government Printing Office, Washington, D.C. FWS/OBS-79/31. 131pp.